

REMARKS

Claims 1-54 remain pending in the application. Favorable reconsideration is respectfully requested in view of the following remarks.

The allowance of claims 17-26, 43-52, and 54 as well as the indication that claims 6-16 and 32-42 define patentable subject matter is noted with appreciation.

Claims 1-5, 27-31, and 53 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over the prior art of figure 1 admitted by applicant on page 5, line 5 to page 7, line 16 (hereinafter “admitted prior art”) in view of Ottosson (WO 00/55992) (hereinafter, “Ottosson”). This rejection is respectfully traversed.

The Office correctly acknowledges that the admitted prior art fails to disclose at least “accumulating correlation values obtained at each of the one or more time slots only for each of the delay values that are not associated with a known cell,” as recited in independent claims 1, 27, and 53. However, the Office relies on Ottosson as making up for this deficiency. This reliance is unfounded for the following reasons.

The present application is directed to the processing of multipath delay information and more particularly to the use of such information during the cell search process. Conventionally, the cell search process comprises three phases: a first phase in which the time slot boundary is found; a second phase in which the slot boundary is used to find the frame boundary; and a third phase in which the knowledge of the frame boundary enables the cell's scrambling code to be determined. Conventionally, during the first phase the received signal is correlated with the primary synchronization code over a range of delay values for each of a number of time slots. The correlated values are accumulated for each tested delay location. The delay corresponding to the largest accumulated peak is extracted as the time slot boundary. This conventional technique results in a waste of processing power when the slot boundary of an already known cell is detected.

To overcome the above-identified deficiencies of conventional techniques, an aspect of the present invention operates using a modified technique for the first phase. Specifically, instead of accumulating correlated values for each tested delay location, methods and apparatuses in accordance with an aspect of the present invention accumulate correlated values only for each of the delay values that are not associated with a known cell.

This aspect of the invention is reflected in each of independent claims: “only for each of the delay values that are not associated with a known cell, accumulating correlation values”

obtained at each of the one or more time slots” (claim 1); “logic that accumulates correlation values obtained at each of the one or more time slots, only for each of the delay values that are not associated with a known cell (claim 27); and “only for each of the delay values that are not associated with a known cell, accumulating correlation values obtained at each of the one or more time slots” (claim 53).

As Ottosson is understood, it fails to disclose or suggest at least this aspect of independent claims 1, 27, and 53 (and consequently, the combination of Ottosson with the admitted prior art would similarly fail to disclose or suggest this aspect) because in each of the various embodiments disclosed in Ottosson, the step of accumulating correlation values is performed over an entire time interval, without exempting delay values associated with a known cell.

Ottosson is directed to a synchronization and cell search method. As explained in Ottosson on page 6, lines 15-22, the conventional cell search procedure

can be adversely affected by characteristics of the radio propagation environment. For example, as the same common synchronization sequence is typically transmitted by base stations serving all of the cells of the system, the synchronization signals transmitted by the stations may interfere with one another, which can make it difficult to identify slot boundaries for a particular synchronization signal associated with a particular cell. This problem may be exacerbated in dispersive channels, where multipath components may cause additional interference.

To address this problem, an aspect of Ottosson discloses not only correlating a signal with a common synchronization code, but also generating an estimated received known synchronization signal based on known channel conditions, and then correlating this estimated received known synchronization signal with the common synchronization code. To reduce the interference, this second correlation value is then canceled from the first correlation value (e.g., by means of subtraction – see FIG. 4). This results in an interference-canceled correlation, which is then accumulated over a time interval, and the accumulation is used for determining slot boundaries.

Of relevance here is the fact that Ottosson merely describes accumulation as taking place “over a time interval.” (See, e.g., Ottosson at page 8, lines 3-4; page 9, lines 10-11; page 10, lines 2-4; page 10, lines 8-9; page 14, lines 15-16 and block 520 in Figure 5; and page 16, lines 1-2 and block 710 in Figure 7). It is also apparent from the embodiments

depicted in Figures 4 and 6 of Ottosson that information about known cells is either applied prior to (Figure 4, block 435) or after (Figure 6, block 615) the accumulator (blocks 410 and 615 of Figures 4 and 6, respectively) – not at the time of accumulation, which is what would be required to satisfy Applicants' claimed "only for each of the delay values that are not associated with a known cell, accumulating" Nothing in Ottosson precludes accumulation from including delay values associated with a known cell.

The Office relies on Ottosson at page 7, lines 2-6 and 14-21; page 8, lines 12-21; page 9, lines 17-26; and page 14, lines 8-22 in support of its allegation that Ottosson discloses accumulating correlation values only for each of the delay values that are not associated with a known cell. This reliance is unfounded, however, because these cited sections of Ottosson merely describe how the interference canceled correlation values are generated. With respect to accumulation of these correlation values, Ottosson teaches that this takes place "over a time interval" as described above.

Accordingly, Ottosson is silent with respect to accumulating correlation values "only for each of the delay values that are not associated with a known cell", as required by each of independent claims 1, 27, and 53. For at least these reasons, the subject matter defined by each of claims 1, 27, and 53, as well as that defined by the dependent claims 2-5 and 28-31, is believed to be novel and nonobvious over the admitted prior art and the Ottosson document, regardless of whether these are considered individually or in combination. It is therefore respectfully requested that the rejection of claims 1-5, 27-31, and 53 under 35 U.S.C. §103(a) be withdrawn.

The application is believed to be in condition for allowance. Prompt notice of same is respectfully requested.

Respectfully submitted,
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